

Abstract Submitted
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Dynamical Quantum Anomalous Hall Effect in the Intense Optical Field Regime WOO-RAM LEE, WANG-KONG TSE, Univ of Alabama - Tuscaloosa — Topological insulators are characterized by the quantum anomalous Hall effect on the topological surface states under time-reversal symmetry breaking. While this effect has been recently observed in a magneto-optical setup upon illumination of weak linearly polarized light, the influence of intense optical field remains largely unexplored. Using the Keldysh-Floquet Green's function formalism, we develop a theory for the dynamical Hall conductivity for arbitrary incident optical frequency in the intense optical field regime. We apply our general theory to the adiabatic, low-frequency regime, and study the breakdown of the one-half Hall quantization under intense optical field. Our results reveal a strong nonlinear dependence of the dynamical Hall conductivity on the incident optical field, which is triggered by the formation of Floquet subbands and the transitions between them.

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